



R.L. GIULIANI
1456 Thurston Ave. A-1204
Honolulu, HI 96822
Pho: (808) 524 6380
Email: r1giuliani@earthlink.net

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Mail Stop Non-fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Re: Inventor: Robert Louis Giuliani

Application no. 10/643274

File date: 08/18/2003

Title: Interchangeable 2-stroke or 4-stroke High Torque Power Engine

CIP of application no. 10/252,927 file date 09/24/2002

Art Unit: 3748

Confirmation no. 4067

INTRODUCTORY COMMENTS

This is the 4th amendment to this CIP application no. 10/643274. The 1st amendment was dated 27 NOV 2003. The 2nd amendment was dated 27 FEB 2004. The 3rd amendment was dated 23 MAR 2004.

There is one amendment to Claim 7 in this 4th amendment. It is the 3rd amendment to Claim 7. No other claims are affected.

One entire subsection in the specification has been replaced including its title.

One drawing (FIG 4) has been changed.

See the REMARKS on sheet 7.

This amendment is believed to be in agreement with Revised Amendment Practice – Effective Date: July 30, 2003.

I can be contacted by the above email or telephone. If by phone, the best time to call is 0730-0830 Hawaii time, 6 hours later than East Coast daylight saving time.

A handwritten signature in black ink.

R.L. GIULIANI
Inventor/Applicant

Small Flywheels.

— A small, suitable flywheel 48 is splined to the end of shaft 43 (FIG 3) to briefly increase chamber pressure for a more complete combustion with decreased emissions. Then, it dispenses the regenerated energy that it gains to moderate the speed of the pistons 38. A conventional flywheel can be used but an alternative comprises three concentric parts. The inner part is splined to shaft 43. The outer part extends to the flywheel's rim. Between them is a tough, slightly elastic part that absorbs some of the initial ignition jolt.

— An equivalent to the flywheel 48 (not shown) is to construct the inner race 4 with springs like the flywheel carried behind the engine of conventional vehicles. The inner race absorbs the ignition jolt.

Moderated Combustion Pressure.

There are least three ways to absorb excessive peak cylinder pressure and dispense it back to the chamber 33 so that a moderated pressure is maintained during the piston stroke to achieve a better burn which increases efficiency and reduces pollution and waste heat.

The first way (FIG 4) uses a two-part piston rod 18 and 18A with a spring 16 between the two parts. Spring 16 is connected to the two parts such that its compression and expansion are not affected. Part 18 has an extension 14 that extends through the center of spring 16 into a cylinder 13 in part 18A (shown in cross section) to keep the spring 16 centered on the axis of the two piston rod parts. Side thrust, if any, will be negligible on the parts because of the combined guide 21 and the piston 38 being square in the cylinder 33.

There are two channels 2 on opposite sides of the cylinder 13 that are aligned with the axis of the cylinder. A small projection 3 on the extension 14 reaches into each channel to prevent angular motion of part 18A and piston 38.

A second way includes a small, suitable flywheel 48 splined to the end of shaft 43 (FIG 3). A conventional flywheel can be used but an alternative comprises three concentric parts. The inner part is splined to shaft 43. The outer part extends to the flywheel's rim. Between them is a tough, slightly elastic part that absorbs some of the initial ignition jolt.

A third way is to construct the inner race 4 with springs like the flywheel carried behind the engine of conventional vehicles. The inner race performs like the flywheel.